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ABSTRACT

Knowledge discovery processes, when used to find information on competitor and marketplace activities, enable organizations to mimic their competitors and/or identify new strategic opportunities where valuable firm resources can be exploited. In this way, knowledge discovery processes can help organizations to develop valuable and unique opportunities and resources, a source of competitive advantage. However, the knowledge discovery process is embedded in and constrained by the organization's institutional context, which impacts the interpretation of novel information. As a result, novel information that is outside an organization's mental models, norms and assumptions may be interpreted as irrelevant, when it is in fact strategically important. This conceptual study integrates two competing theories, institutional theory and the resource-based view of the firm, to develop propositions regarding knowledge discovery for competitive intelligence.

Keywords

Competitive intelligence, knowledge discovery, novel information, institutional theory, resource-based view

INTRODUCTION

Competitive intelligence gathering is a process of knowledge discovery; it involves searching, finding, analyzing, interpreting and using information for strategic purposes (Chung, Chen and Nunamaker Jr, 2005; Cottrill, 1998). Engaging in competitive intelligence involves monitoring the environment to understand competitive and marketplace dynamics (Rao, 2004). The Web provides organizations with access to a wealth of information that can be used for such purposes. However, the ever-increasing amount of information, as well as an increasingly complex competitive environment, have made it more difficult to gather and make sense of environmental information. At the same time, the importance of effectively utilizing competitive intelligence has increased.

Knowledge discovery tools, when used to find information on competitor and marketplace activities, enable organizations to mimic their competitors and/or to identify new strategic opportunities where valuable firm resources can be exploited. Unique and valuable firm resources are a potential source of competitive advantage (Barney, 1991); therefore, exploiting these resources can be more valuable to the organization than imitating competitors. Knowledge discovery tools can help organizations find novel information: information that is not currently known, indirectly relevant and therefore difficult to find (Vats and Skillicorn, 2004). Discovering novel information can assist in developing the firm's valuable and unique resources and uncovering strategic opportunities to use those resources. That is, it can be a source of competitive advantage. However, the knowledge discovery process is embedded in and constrained by the organization's institutional context, which impacts the interpretation of novel information. As a result, novel information that is outside an organization's mental models, norms and assumptions may be interpreted as irrelevant, when it is in fact strategically important.

This conceptual study addresses these rival perspectives on knowledge discovery for competitive intelligence by developing a series of research propositions using two competing theories, institutional theory and the resource-based view of the firm. Using competing theories and the 'logic of opposition' in the analysis of a phenomenon can lead to a richer and more complete understanding of that phenomenon (Robey and Boudreau, 1999; Webster and Watson, 2002). By using a competing theory approach and analyzing the forces that both oppose and promote the discovery of novel information, this study helps to provide a richer understanding of knowledge discovery for competitive intelligence.

This paper is organized as follows. First, the literature on institutional theory and resource-based view will be reviewed. Next, the theoretical discussion section will develop a number of research propositions regarding knowledge discovery for competitive intelligence, discussing both the forces that promote and oppose the discovery of novel information. The paper will conclude with a summary of the limitations, future research opportunities and contributions.

LITERATURE REVIEW

We reviewed the literature on institutional theory and resource-based view, two competing theories, in order to develop research propositions regarding knowledge discovery for competitive intelligence. We begin by defining knowledge.

Knowledge

Knowledge has been defined in a number of ways (Alavi and Leidner, 2001). There are a number of perspectives on its nature. There are different types of knowledge, each requiring a different management approach (Alavi and Leidner, 2001; Beccerra-Fernandez, Gonzalez and Sabherwal, 2004). Space constraints prevent a full review of these definitions, perspectives and approaches here. Traditionally, knowledge has been defined as justified true belief (Nonaka, 1994). Knowledge has also been defined as information with direction, which enables action and decisions (Beccerra-Fernandez et al., 2004). For the purposes of this paper, knowledge is defined as justified true belief and as information with direction, enabling action-taking and decision-making.

Institutional Theory

There are a number of pressures and processes in an organization's environment influencing an organization's behaviour and structure. Institutional theory describes these pressures and helps to explain the homogeneity of organizations across an organizational field, a set of organizations that collectively have the same or highly similar products or services, key suppliers, resources, consumers, and regulatory agencies (DiMaggio and Powell, 1983). In institutional theory, homogenization, more commonly referred to as isomorphism, describes the processes by which organizations change to look more alike.

Institutions, highly resilient social structures composed of cultural-cognitive, normative and regulative elements (Scott, 2001), are a key component of institutional theory. The cultural-cognitive, normative and regulative elements of institutions give meaning and stability to social life and are transmitted through symbolic systems, relational systems, routines and artifacts. The elements of institutions define the cultural, moral, and legal boundaries. These boundaries differentiate legitimate from illegitimate activities and as a result, act as both guidelines for and constraints on behaviour (Scott, 2001). The three elements of institutions, cultural-cognitive, normative and regulative, represent different types of isomorphic pressures and forms of legitimacy, which together explain the homogenization of firms.

Based upon the three elements of institutions, three types of isomorphism and legitimacy are described in the literature: coercive, mimetic, and normative (DiMaggio and Powell, 1983; Scott, 2001). The underlying reason for isomorphism is to gain legitimacy (DiMaggio and Powell, 1983). An organization is viewed as legitimate when its actions and behaviors are viewed as acceptable by social actors outside the organization, and illegitimate when its actions and behaviors are viewed as unacceptable or questionable (Deephouse, 1996; Meyer and Rowan, 1977). The social actors who convey legitimacy vary according to the type of legitimacy. The types of legitimacy and isomorphism will be discussed in more detail below.

Regulative Element

In the regulative view, coercive isomorphism occurs as a result of the influence and demands of other organizations and the need for legitimacy (DiMaggio and Powell, 1983). These influencing organizations include regulatory agencies as well as organizations that control resources needed by other organizations. The former refers to regulatory pressures and the latter refers to resource-dependency pressures (Pfeffer and Salancik, 1978). Regulatory pressures arise from the ability of regulatory agencies to establish rules, inspect conformance and enforce sanctions. These pressures influence an organization's behavior (Scott, 2001). Similarly, resource-dependency pressures arise from the demands of other organizations that control critical resources. Legitimacy is conferred by regulative and legal agencies, as well as external organizations making demands, and is based on conformance to rules, both legal and quasi-legal, and demands (Pfeffer and Salancik, 1978; Scott, 2001). The degree of conformance to these rules and demands is related to the rewards and punishments associated with conformance and non-conformance, as well as the power of organizations to carry out these punishments and rewards.

Cultural-Cognitive Element

In the cultural-cognitive view, mimetic isomorphism results from two types of pressures: competitive and cultural-cognitive. Mimetic isomorphism resulting from competitive pressures arises when organizations imitate other firms perceived to be more successful and more legitimate (DiMaggio and Powell, 1983). Organizations imitate others for several reasons, many of which are tied to uncertainty and causal ambiguity. Faced with uncertainty and ambiguity in terms of what to do and how to do it, organizations will often find it quicker and easier (Cyert and March, 1963; DiMaggio and Powell, 1983) to imitate the observable behaviors of other more successful and legitimate organizations.

The cultural-cognitive pressures that result in mimetic isomorphism refer to the common and shared conceptions, understanding and interpretations of meaning in social life. Mental models and shared interpretations are taken-for-granted and so ingrained in our shared understanding that it is often inconceivable to act or think outside of this model (Scott, 2001). Organizations tend to look alike because they interpret things in the same way and act according to these interpretations. In the cultural-cognitive view, legitimacy is based on adopting the common mental model for a situation and acting in congruence to that model (Scott, 2001). In the case of cultural-cognitive pressures, legitimacy is conferred by society in general, whereas in the case of competitive pressures, the organization's stakeholders confer legitimacy.

Normative Element

Normative pressures involve the beliefs, values and norms that influence behavior. Normative elements include rules, expectations and standards that "introduce a prescriptive, evaluative and obligatory dimension into social life" (Scott, 2001, p. 54). Normative isomorphism is also associated with professionalization, including the process of becoming a professional and professional networks (DiMaggio and Powell, 1983). The professionalization process results in a group of interchangeable individuals who think and behave very similarly and adhere to a common set of guiding principles, values and norms. These individuals will tend to view problems in the same way, implement similar policies and procedures, and make similar decisions. The existence of professional networks results in the continued socialization of professionals, maintaining the homogeneity of individuals in the profession (DiMaggio and Powell, 1983). In the normative view, legitimacy is morally grounded and is related to conformance to an existing set of shared beliefs, norms and values. Thus, legitimacy is conferred by society, or in the case of professionalization, the professional group.

Resource-Based View

The resource-based view is a concept from the strategic management literature that has been used to understand strategy formulation for diversification (Wernerfelt, 1984), competitive advantage and sustainable competitive advantage (Barney, 1991), as well as the strategic value of resources (Wade and Hulland, 2004). The resource-based view is internally focused and assumes firms are made up of heterogeneous and immobile resources (Barney, 1991). Thus, the resource-based view assigns more active agency to the firm in achieving success than theories that focus on the external environment and industry attractiveness. There are a number of conditions underlying the resource-based view, which are linked to achieving competitive advantage (Barney, 1991).

Competitive Advantage

Competitive advantage has been defined in a number of different ways: when a firm improves efficiency and effectiveness in ways that other competing firms are not; when a firm achieves economic rents; when a firm achieves above-industry average profits (Barney, 2001). According to the resource-based view, a resource that is valuable, rare and appropriable will allow a firm to gain a competitive advantage (Barney, 1991; Priem and Butler, 2001). A valuable resource is one that enables a firm to implement strategies that improve the efficiency and effectiveness of the firm (Barney, 1991). A rare resource is one that is uniquely possessed by the firm (Barney, 1991). A resource is appropriable when the owner of the resource retains the rents generated by that resource rather than paying the rents to another party (Grant, 1991; Wade and Hulland, 2004).

Sustained Competitive Advantage

Sustained competitive advantage occurs when a firm implements a strategy that achieves competitive advantage, is not simultaneously being implemented elsewhere, and cannot be duplicated (Barney, 1991). The resource-based view suggests that in order for a firm to sustain a competitive advantage, the resource must also be non-transferable, and imperfectly imitable and substitutable (Barney, 1991). A non-transferable resource is one that is firm-specific and cannot be traded. A resource is imperfectly imitable when it is difficult to duplicate. Imitability is difficult when isolating mechanisms (Rumelt, 1984), many of which are tied to the asset accumulation process (Dierickx and Cool, 1989), prevent duplication. Causal ambiguity is an example of an isolating mechanism (Barney, 1991; Dierickx and Cool, 1989). The imperfectly substitutable condition refers to a lack of resource substitutes that are commonly available or easily imitated. A resource substitute is one that allows a firm to achieve the same strategy, but in a different way (Barney, 1991).

Resources

Resources have been defined as both the assets and capabilities of the firm. Wade and Hulland define resources as "assets and capabilities that are available and useful in detecting and responding to market opportunities and threats" (p 109). Assets refer to the tangible and intangible components used by the firm in the creation, production and sale of its goods or services (Sanchez, Heene and Thomas, 1996). Machinery and reputation are examples of tangible and intangible assets respectively. Capabilities refer to "repeatable patterns of action" used by the firm in the creation, production and sale of its goods or services (Sanchez et al., 1996). Learning is an example of an organizational capability.

Resources rarely work alone to produce value for the organization. The most valuable resources are embedded in the firm's processes and culture (Powell and Dent-Micallef, 1997). The level of embeddedness helps protect a firm's resources from imitation. Powell and Dent-Micallef (1997) measure resource embeddedness by the degree of resource complementarity and cospecialization. Resource complementarity occurs when the value of a resource increases in the presence of another resource. In many cases of resource complementarity, the value of both resources increases. Resource cospecialization is similar to complementarity. However in the case of cospecialization, the resource has little value without the presence of the other resource (Clemons and Row, 1991; Powell and Dent-Micallef, 1997).

THEORETICAL DISCUSSION

Knowledge Discovery for Competitive Intelligence

Knowledge discovery is a term used to describe a set of automatic and semi-automatic approaches for processing data and uncovering interesting information, relationships, and patterns (Grobelnik and Mladenic, 2005). Competitive intelligence involves monitoring the environment to understand competitive and marketplace dynamics (Rao, 2004). The Web provides an important source of information for businesses (Beccerra-Fernandez et al., 2004; Chung et al., 2005). However, the volume of information on the Web creates information overload, making it difficult for organizations to identify potentially useful and important information. Knowledge discovery techniques can help alleviate the problems associated with information overload and direct the organization's attention to consequential and novel information (Chung et al., 2005; Rao, 2004).

Knowledge discovery, although focused on the automated techniques and technologies for uncovering hidden relationships and patterns, is an exploratory process. Despite the frequent focus on eliminating the need for human intervention in knowledge discovery, the process of exploration and discovery does rely on humans in the process and is embedded within an organizational and institutional context. This context can affect the knowledge discovery process and outcomes. Thus, it is important to examine the discovery process *within* this context. The following set of research propositions will examine knowledge discovery for competitive intelligence within the institutional context and the forces that oppose and promote novel information discovery.

The process of competitive intelligence includes the search for and collection of market information, the interpretation of this information, the storage of the resulting knowledge in organizational memory (Day, 2002), and in some cases, the identification of strategic alternatives to pursue. Resources can be combined in many different ways, creating strategic options: the alternative strategies an organization can choose to pursue. Penrose (1959) defines resources as a bundle of possible services, which contribute to the operation of the firm. Each resource can be used in different ways and for different purposes. Each firm is aware of a subset of the possible services a resource can provide and due to economic constraints, chooses to leverage a portion of those services. However, when organizations search for market information, the experience and knowledge of the firm will determine what the firm 'sees' in the external world and how it reacts to new knowledge obtained (Penrose, 1959). Furthermore, organizations collect market information from familiar sources and allow outsiders to define the market by the categories used to organize information, affecting interpretation (Day, 2002). As a result, the existing market boundaries and resource services are reinforced rather than reconceptualized to create new opportunities and resource services. When organizations engage in knowledge discovery for competitive intelligence, information found that conforms to the current shared mental model will be viewed as more legitimate. This leads to the following proposition:

> P1: As a result of mimetic isomorphic pressures, organizations will tend to ignore novel information that does not conform to society's and stakeholders' shared mental models in favour of information that does conform to these models.

In a competitive marketplace, organizations will tend to imitate the visible behaviors of successful firms. Information found during the knowledge discovery process that aligns with the visible behaviour of successful firms will be viewed as more legitimate. This leads to the following proposition:

> P2: As a result of mimetic isomorphic pressures, organizations will tend to ignore novel information that differs from the visible behaviour of successful firms in favour of information that is most similar to these behaviors.

This proposition assumes that organizations actively and intentionally seek success. However, organizational inertia and indifference to success may result in a lack of conformance to mimetic pressures. Organizational inertia and indifference towards success also suggest that an organization would not attend to or value novel information.

The organization's regulatory environment will also affect the perception of novel information. Information that readily conforms to the rules enforced by the regulatory and legal entities will be viewed as more legitimate. This leads to the following proposition:

> P3: As a result of coercive isomorphic pressures, organizations will tend to ignore novel information that does not appear to conform to the rules enforced by regulatory and legal entities in favour of information that does conform to these rules.

Similarly, the demands made on an organization will affect the knowledge discovery for competitive intelligence process. Information that conforms to these demands will be viewed as more legitimate. This leads to the following proposition:

> P4: As a result of coercive isomorphic pressures, organizations will tend to ignore novel information that does not conform to the demands of other organizations on which they depend for valuable resources in favour of information that does conform to these demands.

When an organization is composed of a dominant and homogeneous professional group, the knowledge discovery for competitive intelligence process will be affected by the professional group's shared beliefs, norms and values. Information that conforms to these shared beliefs, norms and values will be viewed as more legitimate. This leads to the following proposition:

> P5: As a result of normative isomorphic pressures, organizations with a dominant and homogeneous professional group will tend to ignore novel information that does not conform to the shared beliefs, norms and values of that group in favour of information that does conform to these beliefs, norms and values.

Propositions P1 through P5 suggest that as a result of institutional pressures, organizations will pay more attention to certain types of information. In addition, organizations passively comply and adjust to institutional pressures, rarely exerting organizational agency and choice. However, firms are motivated by profit maximization and act accordingly. Discovering novel information may lead to the recognition of strategic alternatives that increase the value of existing firm resources and achieve competitive advantage. In some cases, adhering to institutional pressures conflicts with the efficiency and other objectives of the organization (Meyer and Rowan, 1977). As active agents, organizations can choose how to respond to institutional pressures (Oliver, 1991). The table below lists a number of different organizational responses, in order of increasing level of resistance (Oliver, 1991).

Strategies	**Tactics**	**Description**
Acquiesce	Habit	Unconsciously conforming to norms.
	Imitate	Mimicking institutional norms.
	Comply	Consciously conforming to norms.
Compromise	Balance	Balancing demands of multiple institutional stakeholders.
	Pacify	Accommodating institutional elements.
	Bargain	Negotiating with institutional stakeholders.
Avoid	Conceal	Disguising nonconformity.
	Buffer	Decoupling external image of conformance from internal activities.
	Escape	Changing goals, activities or domains to make demands irrelevant.
Defy	Dismiss	Ignoring norms and rules.
	Challenge	Contesting rules and demands.
	Attack	Assaulting the sources of institutional pressure.
Manipulate	Co-opt	Importing influential constituents.
	Influence	Shaping values and standards.
	Control	Dominating institutional stakeholders.

Table 1 – Strategic Responses to Institutional Processes (from Oliver, 1991)

Thus, an organization can choose to resist the institutional pressures that suggest certain types of novel information are illegitimate. This leads to the following proposition:

> P6: Organizations that value particular types of novel information will tend to resist institutional pressures that suggest these types of novel information are illegitimate.

However, resistance may not be possible if there are strong regulatory pressures, or dependency on external organizations is high. Decoupling can be an effective resistance technique when an organization's external image is loosely linked to its internal operations (Meyer and Rowan, 1977). In this case, an organization can present the appearance of conformance to institutional pressures, yet not actually implement changes to its internal operations. This leads to the following proposition:

> P7: Organizations that value particular types of novel information will tend to present an external image that conforms to institutional pressures that suggest these types of novel information are illegitimate, yet internally attend to novel information.

Causal ambiguity, referring to uncertainty about *which* resource led to competitive advantage and/or uncertainty about *how* the resource led to competitive advantage (Barney, 1991), can affect the outcomes and process of knowledge discovery. Causal ambiguity is a powerful isolating mechanism to prevent imitation; however, it may also pose problems when the organization itself does not understand why it is successful. Novel information may permit the firm to capitalize on unique strategic opportunities that other competitors have not yet discovered or understood. Thus, discovering and recognizing opportunities as possible strategic alternatives may allow a firm to gain a competitive advantage. This leads to the following proposition:

> P8: As a result of the knowledge discovery process, an organization may identify new strategic opportunities not yet discovered or understood by competitors, which may provide competitive advantage.

However, the causal ambiguity regarding the novel information uncovered may make it difficult to recognize the opportunity as valuable. Thus, causal ambiguity is both an opposing and promoting force in knowledge discovery. This leads to the following proposition:

> P9: Causal ambiguity related to a potential strategic opportunity found may negatively impact the evaluation process within the knowledge discovery process.

Institutional theory and the resource-based view, as demonstrated above, are competing theories. Institutional theory suggests that firms tend to be homogeneous; the resource-based view suggests that firms value heterogeneity. The resource-based view assumes organizational decisions are based on economic rationality, whereas institutional theory assumes normative rationality. Institutional theory, often an opposing force, inhibits the discovery of highly novel information[1]. The resource-based view, primarily a promoting force, encourages and values the discovery of novel information. Oliver (1997) reconciles these rival perspectives by suggesting that firms differ in their ability to control the institutional context affecting resource decisions. Oliver (1997) introduces the concept of institutional isolating mechanisms: "barriers to imitation which result from a firm's reluctance to imitate or acquire resources that are incompatible with the firm's cultural or political context" (p. 704). In contrast to the isolating mechanisms discussed in the resource-based view, for example causal ambiguity, institutional isolating mechanisms explain why organizations are unwilling to imitate another firm's valuable resources. An organization can overcome institutional isolating mechanisms if it is able to control its institutional context by motivating both political and cultural support for developing valuable resources (Oliver, 1997). This leads to the following proposition:

> P10: The firm's ability to motivate cultural and political support for novel information discovery will positively affect the evaluation of novel information.

Institutional theory, an opposing force in the knowledge discovery process, suggests a number of constraints that negatively affect the search for and evaluation of novel information. However, the resource-based view, a promoting force, assigns more active agency to firms; firms will not only resist institutional pressures, but also actively search for and attend to novel information. According to the resource-based view, discovering novel information can help uncover strategic alternatives and increase the value of existing resources.

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[1] Institutional theory promotes the discovery of information that is similar to existing norms, rules and mental models.

CONTRIBUTIONS, LIMITATIONS AND FUTURE RESEARCH

This analysis is conceptual in nature, developing competing arguments based on institutional theory and the resource-based view. Future research is needed to empirically test our propositions, and explore how the forces opposing and promoting knowledge discovery for competitive intelligence interact. This study extends the knowledge discovery literature, often technically focused, to include the organizational and institutional contexts affecting both the processes and outcomes of knowledge discovery for competitive intelligence. Our use of competing theories helps provide a richer understanding of this phenomenon. By utilizing institutional theory, this study addresses the call for more MIS studies in this area (Orlikowski and Barley, 2001). In addition, our analysis can help practitioners understand the institutional and organizational constraints that affect their search for important strategic opportunities, as well as the potential value of knowledge discovery for competitive intelligence.

CONCLUSIONS

Competitive intelligence gathering is an important organizational activity that can uncover valuable market and competitor information. The vast amount of information available on the Web, a key information resource, makes competitive intelligence a difficult task. Knowledge discovery tools can help organizations find novel information, which can direct organizations towards valuable and unique opportunities and resources that are sources of competitive advantage. The knowledge discovery for competitive intelligence process is embedded in an organizational and institutional context, which can affect both the process and its outcomes. According to institutional theory, organizations may be unwilling to accept and assimilate novel information found using knowledge discovery tools because these results are not aligned with their existing norms, routines and mental models. However, the resource-based view suggests that organizations, as active agents, can effectively resist institutional pressures. Accordingly, organizations will value and attend to novel information, which can lead to the development of unique resources and new strategic alternatives.

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